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The Interaction of Nutrition and Parasitism with special reference to Parasitic Gastritis*

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It is unfortunate that the subdivision of an extensive study such as comes under the heading of "Veterinary Science" should leave an indeterminate border-line between the component parts, so that certain important subjects tend to fall into a no-man's land of veterinary literature and education, and may escape the attention which they deserve. The present paper deals with such a border-line subject—the disease aspect of an association between certain parasites and their hosts—and may be regarded, by some, as a contribution to "Veterinary Medicine" rather than to "Veterinary Parasitology" because its object is to explain the development of disease and not the development of parasites. It is brought up for discussion here on account of its topical war-time interest and because of the important place which it has recently taken in the parasitologist's view of disease production by helminths. The subject falls naturally into two sub-divisions; firstly the effect of the parasitic helminths upon the nutrition of the host, important from the point of view of pathogenicity; and secondly, the effects of the nutrition of the host upon the parasitic helminths, which is of great importance from the epidemiological point of view. The latter consideration is also of the greatest practical importance since it operates in the sphere of man's activities and may present practical means for control.

That disease production is a disadvantage to successful parasitism appears, at last, to be generally accepted as one of the principles of parasitology. Death of the host leads to death of the parasites that are living on it, and even a state of chronic disease that results in a curtailment of the normal span of life must, among the parasites, be regarded as an antisocial act. This requirement for a harmonious existence of host and parasite has, doubtless, exerted a potent selective action in the evolutionary development of host-parasite relationships, so that we now see some of the most amazingly perfect adaptations, examples of "neighbourliness without love," in which the host and parasite live together in a state of mutual tolerance that asks no benefits and causes no harm. The tapeworm cyst, *Coenurus serialis*, for example, not only contrives to develop, very slowly, in parts of the rabbit's body where it is least likely to cause any harm, and without producing physiological by-products that might injure the host, but it has evolved a mechanism that ensures the development of only one or two cysts at a time, usually one, so that the host shall not be asked to entertain too many guests at once. Like the better class parasites known in some other spheres, it has, at least, the saving grace of good manners.

The balance of host and parasite for the trichostrongylid worms of parasitic gastritis is not quite so perfect but nevertheless under conditions of extensive grazing is, generally speaking, proof against the development of disease. This nicety of adjustment is maintained through the interaction of two factors, the production of excessive progeny on the part of the parasite, and the development on the part of the host of a resistance that is adequate for protection against excessive parasitism.

From the biological point of view, this resistance is seen to be beneficial to the parasite as well as to the host since it prevents the extermination of the host species and the consequent extermination of the species of parasite that is dependent upon it. Observations on the rate of increase of worm infestation of lambs clearly show that were it not for the development of a resistance in the lamb the maintenance of sheep in this country would be impossible, for they would all die of parasitic gastritis before completing the first year of their lives. There are, actually, one or two interesting examples of infectious disease that seem to owe their disappearance to the extreme pathogenicity of the causal agent. It is thought by some, for instance, that Newcastle disease of fowls which was rapidly fatal when it first appeared in this country, effectively carried out its own "slaughter policy" by quickly killing off the whole community into which it had been introduced. A similar circumstance may have led to the disappearance of a severe and rapidly fatal disease of man called "sweating sickness" to which frequent reference is made, so I understand, in writings between 1485 and 1552, but which seems to have died out very suddenly and not to have reappeared since.

Parasites must not be regarded, therefore, as endeavouring to injure their host, but only as causing harm under unnatural conditions to which their evolutionary development has not adapted them. In considering their effect upon the host we might first take into account the rather naïve suggestion, still found in most of the textbooks, that they cause injury by diverting to their own use nutriment intended for the host. If, however, a comparison be made between the weight of the living tissue of the parasites with that of the host, it will be agreed that any observable injury may be discounted. The harm sustained by the host in that way might be compared with the harm suffered by a fattening bullock as a result of the occasional visits of a sparrow, who "diverts to his own uses the nutritive material intended for the bovine, and ultimately for man." No one would deny that it is wicked so to do, but it is of no practical importance.

The next point to consider is the possibility of direct injury to the digestive tissues and absorptive surfaces of the intestinal tract, preventing the proper digestion and absorption of nutriment by the host. Examination of the mucous lining of the stomach and intestines in cases of parasitic gastro-enteritis, however, fails to provide the necessary evidence and pathological changes in the tissues are usually wanting. The terms "parasitic gastritis" and "parasitic gastro-enteritis" are, therefore, misnomers in that the inflammation which they denote is usually absent even in cases of acute and fatal disease.

Perhaps the best guess as to the harmful action of these parasites, and their effect on the nutrition of the host is that of the production of excessive amounts of an antienzyme, adequate not only for the protection of the parasites in their proteolytic environment, but also sufficient to interfere with the host's digestive processes. Claims have been made to have demonstrated an effect of this kind but as yet they have not been confirmed, nor has the association of anti-enzymes with parasitic worms been satisfactorily demonstrated, with the possible exception of ascaris. This explanation, therefore, rational as it may seem, still remains a theoretical one, and a group of American workers who demonstrated the harmful effect on nutrition of a relatively slight infection with trichostrongylid parasites, concluded that the pathogenic effect must have been brought about through an increased energy metabolism resulting from the nervous excitation of the host, this excitation, in its turn, being dependent upon the irritation of the intestinal mucosa by the parasitic worms.

One of the earliest observations concerning the effect of the nutrition of the host upon the parasite was made by a Japanese investigator who found that by starving pigs of vitamin A he could break down their resistance to infection with *Ascaris lumbricoides* of human origin, which infection cannot be brought about under normal dietary conditions because of the host specificity of the two strains. It has subsequently been shown that a deficiency in vitamin A similarly affects resistance to some other helminths, also that vitamin B deficiency acts in the same way, and may exert an influence over the size to which the parasitic worms will grow. There are, however, strict limits to the extent of increased susceptibility that can be brought about in this way, and in the main host specificity is unassailable.

Some of the earlier Rockefeller Foundation hookworm observations suggested an association between under-nourishment and heavy hookworm infestation, which association was afterwards thoroughly substantiated by controlled laboratory experiments. In these experiments the resistance of age-immune dogs and of dogs that had acquired a strong resistance to hookworms as a result of previous infestation was broken down by under-nourishment. A further attempt was then made to ascertain whether this loss of resistance could be attributed to any particular part of the diet, but without success. No significant differences were observed in rats kept on diets rich in carbohydrates or proteins as compared with those on a well-balanced diet—vitamin content being adequate in both instances—but it was observed that rats kept on a diet of coarse vegetables and fruit, on which they lost weight and began to look unthrifty, acquired more parasitic worms from a given inoculation, and harboured them for a longer period than did rats on more favourable diets.

An experiment carried out on sheep at Weybridge gave a similar result. In this experiment a group of lambs was divided into three

* Paper based on an address given to the Sussex Division of the N.V.M.A. at Bristol on November 13th and to the South-Eastern Division of the N.V.M.A. at Maidstone on November 26th, 1942.

sub-groups, which were fed (*a*) on a full ration of hay and concentrates; (*b*) on hay only; and (*c*) on straw only. All received infective trichostrongylid larvae at the same rate; but at autopsy it was found that the lambs on full diet carried some 3,000 worms each; those on hay only, some 9,000 each, and those on the starvation diet of straw only, some 14,000 worms each.

A further experiment was carried out in which groups of heavily infected lambs were placed on different diets: (*a*) a full ration; and (*b*) a diet of hay only. It was found, at the end of the experimental period of seven months, that the egg count in the faeces of the lambs on the full ration had fallen to one-ninth of its original level at the beginning of the experiment, whereas that of the group placed on hay only, in spite of the absence of any further infestation, had risen to five times its original level. One of the first signs of a developing resistance is the partial inhibition of the egg production in the parasitic worms, the increased egg production observed in this experiment being attributable to the converse action. Investigations elsewhere have demonstrated the same effect—that a low nutritional level operates both on the rate of the acquisition of infestation, allowing a large proportion of acquired larvae to come to maturity, and on the rate of elimination of adult worms already present.

That minute parasitic worms are necessarily short-lived and that the parasitic population is maintained at any given level through death of parasites from senility on the one hand, and continued reinfestation on the other, is a wrong conception. Parasitic helminths in general are long-lived creatures, 10, 20 and even 30 years' life has been reported for some. The unsurpassed conditions of equable temperature and abundance of food in which they live doubtless work towards that end, and it is not unlikely that the longevity of the parasitic helminths would equal that of the sheep were it not for the active operation of the hosts' resistance mechanism which curtails their lives and prevents the acquisition of further infection. The unhampered development of the resistance, therefore, is of the greatest practical importance to the maintenance of the health of animals under grazing conditions in which an adaptation must be made to an increasing rate of intake of parasites, reaching perhaps some 5,000 or more infective larvae daily, and at a time of year when the herbage is deteriorating both in quality and in quantity.

The annual population cycle of trichostrongylid nematodes in the sheep and on the pasture commences in the spring with the arrival of worm-free lambs, newly born into a "wormy" world. Soon they begin to eat the grass which is carrying infective larvae in relatively small numbers, some 30 or 40 per pound of herbage. Between two and three weeks after their first infection they begin to pass eggs out on to the ground. These reach the infective stage some few days later and go towards the production of a heavier infection in the lambs, and the deposition of more eggs on the pasture, an increase by geometric progression which, as the weeks go by, results in the development of a heavy infestation of both the lambs and the pasture. The rate of increase is so great, in fact, that were it not for the development of a resistance to the parasitic worms it would be quite impossible to maintain lambs on our agricultural pastures, for they would all die of acute parasitic gastritis. Partly as a result of their growth to maturity, however, and partly as a result of the infection acquired in early life the lambs begin to build up a resistance and an increasingly smaller percentage of acquired larvae develop to maturity. This resistance continues to develop; fewer and fewer worms reach maturity; egg production by the worms is inhibited to an increasingly greater extent; a comparatively rapid expulsion of the worms follows as the resistance of the lamb becomes properly established and the infestation falls to the comparatively low level of that carried by healthy adult sheep.

These changes are diagrammatically represented in Fig. 1, the broken line showing the theoretical rate of increase and the complete line the actual rise and fall of infestation resulting from the development of resistance.

The account that has just been given of the rise and fall of worm population presumes the presence of adequate nutrition together with only a moderate infestation of parasites and makes no reference to disease. Conditions such as obtain on the majority of our sheep farms, however, are more trying and the ultimate establishment of the lambs' resistance is not achieved without a struggle entailing a loss of growth rate for the lambs and a considerable loss of profit to the farmer. The principal reason for this is the deterioration of the pasture herbage both in nutritive value and in actual amount from the spring and early summer onwards; a strain on the young growing animal that reaches its peak at the time of weaning when the maximum infestation of the pastures and of the lambs coincides with low nutritive value of the herbage and sudden withdrawal of the milk supplement.

The annual population cycle of worms which has just been described may be fitted into the annual disease cycle of parasitic gastritis in the following way: Beginning again with the new worm-free lambs born on to infected pastures, and comparing their growth with that of worm-free lambs on worm-free pastures we find, after piecing together the available data, that for some weeks and perhaps for two or three months, the actual growth of the now-infected lambs shows no difference from that of the hypothetical worm-free lambs. When the parasitic infestation has reached a certain level, however, it begins to take effect and gain in weight is less than it ought to be. This divergence from the ideal continues up to the time of year at which the resistance is usually established, and for long afterwards in those instances in which something has occurred to prevent its establishment. Unfortunately the nutritional state of growing

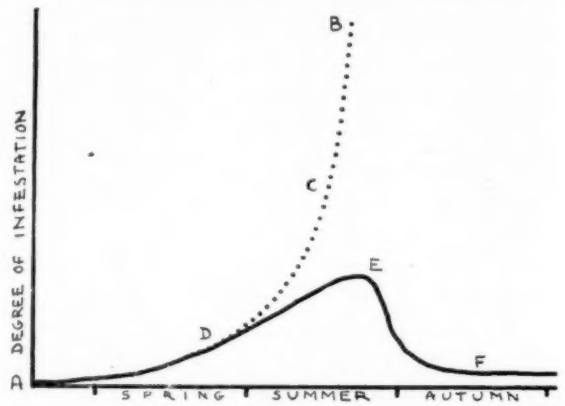

Fig. 1, showing the theoretical rate of increase of worm infestation in non-resistant lambs, compared with the actual variations brought about through the normal development of resistance.

AB = the theoretical increase of worm infestation in lambs that retain their complete susceptibility. AF = the actual variations in the infestation of healthy lambs maintained on an adequate diet. C = the point at which fatal disease would result if a lamb were to retain its susceptibility. D = the point at which resistance begins to develop. E = the point of the final establishment of the resistance when large numbers of worms are expelled. F = the low level of infestation of resistant adult animals.

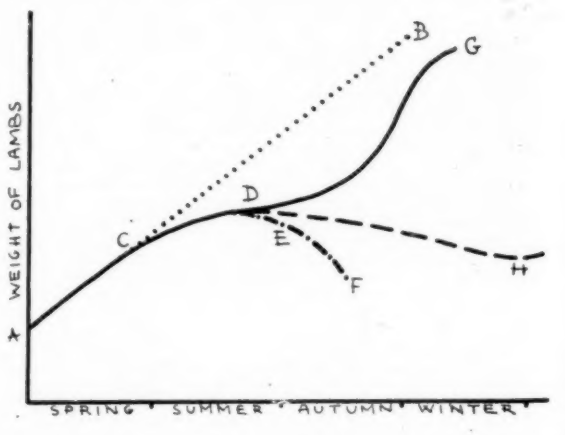

Fig. 2, showing variations in the weight of growing lambs dependent upon the interaction of nutrition and parasitism. AB = the unhampered growth of worm-free lambs fully nourished and on worm-free pasture. C = the point at which parasitism begins to affect the rate of growth. D = weaning time, the most critical period. DF = the effect of extreme undernutrition, or excessive intake of infective larvae. E = the point at which the first symptoms of clinical disease appear and F = the point of death. DG = the recovery that follows the application of anthelmintic treatment and a supplement to the diet, and DH = the gradual decline in weight brought about by the continuance of a heavy infestation of worms throughout the winter months. H = the point at which the growth of nutritious spring grass enables the lambs to develop their resistance and throw off the worms. CD and DH are the periods o sub-clinical parasitism, DH being the more important,

lambs frequently falls to a level low enough to impede the development of this resistance. As the summer advances the herbage becomes poorer in quality and may be deficient in quantity, particularly during times of drought when the nutritional level may fall very low indeed. Weaning takes place before the resistance of the lambs has reached its height and a still greater strain is put upon them. In addition to this the pastures are at that time carrying a greater number of infective larvae, ranging up to 300 or 400 per pound of herbage, and the state of parasitism of the lambs verges on the border-line of clinical disease.

If at this time the pastures are particularly poor, or the intake of infective larvae particularly high, clinical disease will make its appearance and a typical outbreak of parasitic gastritis develops. If, on the other hand, grass is very plentiful, or if proper precautions are taken at this most critical period, such as the administration of suitable anthelmintics or of a supplementary ration of food, or both, the development of adult resistance will be effected and the worms will be expelled. The lambs will then regain most of the loss of weight sustained through the state of parasitism in which they have lived throughout the summer.

It frequently happens, however, that neither is proper anthelmintic treatment given at the critical period of weaning, nor is an allowance of supplementary food made. Unaided in this way, the nutritional inadequacy of autumn and winter grazing takes effect, the infestation acquired during the summer persists throughout the autumn and winter, and lambs which ought to have been sold fat during the autumn continue to lose weight until the appearance of the new growth of grass in the following spring. The lambs may then throw off their parasites and regain their weight, but valuable time has been lost and food wasted. There can be no doubt that the condition of poor thriving so often seen in lambs at about the time of weaning is usually a condition of sub-clinical parasitism which could largely be avoided. The time of weaning appears to be the most critical in this respect and it is then that anthelmintic treatment or supplementary feeding could most advantageously be applied.

Parasitic gastritis provides a very good example of the value of the epidemiological approach to the study of helminthic disease, as contrasted with the narrower parasitological approach which aims only at the destruction of the parasite. Direct attempts at the eradication of a pest may often have little hope of success whereas a more general attack, comprising partial pest control and improved methods of husbandry, may give excellent results.

Over-specialised control, as in concentrating on the destruction of a parasite, appears to be one of the dangers to avoid in the study of disease, and it is clear that malnutrition must be counted among the important causes of the helminthiases of our domestic stock.

MINISTRY OF AGRICULTURE NEWS SERVICE

Less Molasses: Cattle Feeding Supplies Cut.—Molasses is an important munition of war. Supplies for use in cattle feeding are having to be cut down, so less will be available as binding and sweetening material in the manufacture of compound oil-cake nuts and cubes. The supply of ready-mixed rations will not be restricted in total, but a greater proportion of them will be in the form of dry meals. In future, stock-feeders will have to rely more on their own home-grown foods and on compound meals and such oilcake as may be available.

To avoid waste with dusty meals and to increase their palatability it will be necessary to mix such foods judiciously and perhaps moisten the mixture before feeding. It is realised that this means more labour. In the present emergency, however, farmers have successfully overcome much greater difficulties. They will not boggle at this one.

Dried Sugar-Beet Pulp More Plentiful.—The prudent farmer has taken steps to provide himself with as much home-grown feeding-stuffs as possible from his own land. Nevertheless, there are still many feeders—particularly milk producers—who have to buy concentrated feeding-stuffs to supplement those produced on the farm. Dried sugar-beet pulp should make special appeal to them. There is no other carbohydrate feed on the market to equal it in price or digestibility. It contains more than three-quarters carbohydrates, of which the bulk is digestible.

All kinds of stock readily eat this dried pulp and it has been fully proved that it will replace oats in both the production and maintenance ration of dairy cows. Supplies are, of course, limited, but owing to the good crop, sugar-beet pulp is rather more plentiful than was originally estimated. Farmers who make application to their dealers should be able to get what they want if they order without delay and submit the appropriate coupons.

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The number of attested herds, *i.e.*, herds officially certified as free from tuberculosis, in 1942 was: Scotland, 3,390; England, 3,911; Wales, 8,844.

CLINICAL COMMUNICATIONS

Stilboestrol in Dystokia

R. C. G. HANCOCK, B.Sc., M.R.C.V.S.
Beaconsfield

The subject of this note is a Scottie bitch 3 years old in good health and primiparous.

At midnight on January 13th I was called out to visit the bitch, and found her uneasy, with a history of just perceptible pains for the previous four or five hours. Temperature was normal, and digital examination showed the os dilated enough for a head of a puppy to be felt. It was decided to delay interference to allow full dilatation to develop, and 10 units of pituitrin were given hypodermically. It was arranged that I should be informed if the births did not take place. It was not until January 15th, nearly 36 hours later, that the bitch was brought to my surgery, having failed to produce a puppy. The owner had concluded that as no further labour pains had occurred since my visit, and as the bitch was not due until January 17th, the incidents of January 13th were in the nature of a false alarm. Digital examination showed the puppy's nose at the pelvic outlet as before, and 20 units of pituitrin were given. Three hours later at midday a dead puppy was removed by forceps. At 11 p.m. on January 15th no further puppy had descended, the bitch's abdomen was tense and non-palpable as to its contents; temperature 102·5°. On January 16th no foetus was within finger reach at 9 a.m. One mgm. stilboestrol was given, followed at 10 p.m. by 10 units of pituitrin. During the night a foetus was born, dead and macerated, without assistance. Milk was taken voluntarily.

On January 17th, the bitch seemed in good spirits, but no further foetus was within reach. Temperature normal. Milk again taken. There was a chocolate coloured offensive discharge from the vagina. At 2.30 p.m. the head and shoulders of a foetus was removed by hand from the vagina, the bitch having removed the hind half of the foetus herself.

On January 18th the abdomen was relaxed, and it was possible to palpate the organs and be sure no more puppies were unborn. Temperature normal, discharge slight and green in colour.

On January 19th the bitch went home looking none the worse for her prolonged ordeal.

The interest of the case to me was the apparent value of the stilboestrol in creating labour pains, where pituitrin alone had failed, and it appeared to conquer a threatening sepsis as well.

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Stilboestrol in Epilepsy

In a further note to that published from him on this subject in our issue of February 6th, Mr. Hancock writes: "A Dachshund bitch six months old was brought to me with a history of regular fits occurring once or twice a week from the age of three months. The bitch was undersized and a bad specimen physically. One mgm. stilboestrol was given, with gr. xx calcibronat (Sandoz) b.i.d. in the food. A week later the owner reported a heat commencing three days after the injection, and that the fits had stopped. Three weeks later no further fits had occurred.

"I hope to try out this drug in selected cases of epilepsy in the male. Presumably it stimulates the pituitary body and restores hormone balance within the body."

Weekly Wisdom

For, subtile people may indeed marke more curiously, and observe things more exactly, but they amplifie and glose them; and the better to persuade, and make their interpretations of more validitie they cannot chuse but somewhat alter the storie.

They never represent things truly, but fashion and maske them according to the visage they saw them in; and to purchase credit to their judgement and draw you on to believe them they commonly adorne, enlarge, yea, and hyperbolize the matter.—Montaigne: "Of the Canibalees."

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The sixth report of the Empire Rheumatism Council stated that clinical research has been carried on (1) to find if any "specific" diagnostic tests for rheumatic conditions exist; (2) to estimate the value and appropriate dosage of gold salts in the treatment of certain rheumatic conditions; (3) to test the efficacy of "a method of treatment regarding which favourable results have been reported from a provincial hospital." No definite conclusions can yet be announced.

ABSTRACTS

[ASCORBIC ACID IN CERTAIN BODY FLUIDS OF HORSES. Errington, B. J., Hodgkiss, W. S., and Jayne, B. S. (1942.) *Amer. J. vet. Res.* **3**. 242-247.]

Certain body tissues and fluids have been found to contain relatively high concentrations of ascorbic acid, which in some cases are independent of the level in the blood. The authors found that the average ascorbic acid content of the blood plasma of 112 normal horses was 0·73 mg./100 c.c., with a range of 0·30 to 1·76 mg./100 c.c. In horses with no symptoms of periodic ophthalmia the average ascorbic acid content of the aqueous and vitreous humours was 21·91 mg./100 c.c. and 20·41 mg./100 c.c. respectively. The level in the aqueous humour of five horses affected with periodic ophthalmia was 9·19 mg./100 c.c. The authors state that, in view of the small number of cases investigated, it is impossible to determine whether a lowered ascorbic acid content of the eye fluids is a factor in the aetiology of periodic ophthalmia or simply a result of the inflammation and consequent change in the permeability of the blood vessels.

The ascorbic acid content of the spinal fluid of 12 normal horses ranged from 0·083 to 3·25, average 1·70 mg./100 c.c. In 11 "wobblers" (a disease distinguished by degeneration of the spinal cord and spinal nerves) the level ranged from 0·065 to 2·16, average 1·31 mg./100 c.c. No comment can be made as to the significance of the tendency for a decrease in the ascorbic acid content of the spinal fluid of "wobblers."

In the semen of 20 stallions, the ascorbic acid ranged from 0·34 to 2·63, average 0·86 mg./100 c.c. Two of the stallions had poor breeding records, but the ascorbic acid level of their semen could not be related to their low fertility.

Horses, as has also been found with cattle, apparently do not assimilate ascorbic acid when it is administered *per os*. Intravenous administration results in a rapid rise in the plasma level of ascorbic acid followed by a comparatively quick decline. When administered subcutaneously, the rise is equally rapid, but the level remains higher over a longer period than is the case after intravenous injection. N. J. S.

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[RIBOFLAVIN IN RATIONS FOR POULTRY. Fairbanks, B. W., and Hamilton, T. S. (1942.) *N. Amer. Vet.* **23**. 575-578.]

From a study of the relevant literature it is assumed that growing chicks require 300γ of riboflavin per 100 g. of ration for normal growth and prevention of curled-toe paralysis. The riboflavin content of some of the more important poultry feeding-stuffs is given, and it is shown that inadequately supplemented cereal rations may be markedly deficient in riboflavin, and that any shortage of milk products, *e.g.*, dried skim milk, may lead to difficulties in this connection unless steps be taken to include such products as liver meal, dried yeast, lucerne meal or young green cereal plants. A ration consisting of maize 44, wheat 25, oats 20 and meat scrap 11 contains only about 70 per cent. of the necessary riboflavin, whereas rations consisting of (1) maize 40, wheat 25, oats 20, meat scrap 8, soya bean oil meal 5, dried whey 2, liver meal 1, or (2) maize 40, wheat 20, oats 10, meat scrap 8, soya bean oil meal 5, lucerne meal 5, contain adequate amounts of the vitamin.

A. N. W.

REPORT

[DEPARTMENT OF AGRICULTURE, CANADA. Report of the Veterinary Director General for year ended March, 1942.]

Difficulties arising from war conditions threw added strain on the Animal Health Division of the Production Service of the Department, but, as the Director General of the Division, Dr. A. E. Cameron, points out, in his covering letter to the report, these were successfully encountered by a spirit to render service to the war effort. The whole of the inspectional staff worked long hours under increased pressure to meet the demands, and much of the work, conducted outside normal hours of duty, was devoted to facilitate the export of food products to Great Britain. Increased measures had to be applied also, under trying circumstances, to prevent the introduction of foot-and-mouth disease through various potential channnels of infection. Nevertheless, the staff managed at the same time to continue their work on tuberculosis and Bang's disease eradication, a campaign that has been in hand now for some years. During the year under review 1,175,050 tuberculin tests were made and at the time of reporting approximately half the cattle in Canada were under tuberculous-control supervision, and several counties cleared of the disease. Progress with the eradication of Bang's disease, though slower, is making headway and 1,492 herds were declared free at the end of the year. In addition, the serious outbreaks of swine fever which occurred in the previous year were brought under control.

These are fine achievements under trying circumstances and indicate the part the profession can play towards communal prosperity under a director of the calibre of Dr. Cameron.

No cases of anthrax, glanders, rabies or horse mange were reported during the year and no cases of dourine or sheep scab have occurred in the Dominion for 21 and 14 years respectively.

Under the Director General are two Chief Veterinary Inspectors, one in charge of the Contagious Diseases Section and the other of the Meat and Canned Food Section. The number of establishments working under the Meat and Canned Foods Act was 93, and as an index of the work involved in inspecting these there is the fact that over ten million animals were slaughtered in them during the year and much of the meat canned and exported.

W. K.

IN PARLIAMENT

Peers Debate Agriculture

The recent two-days' debate in the House of Lords on agriculture was initiated by Earl De La Warr, who moved "That this House is of the opinion that a sound agriculture is vital to the economic and social well-being of this country and urges the Government to carry out its pledge to formulate an agreed All-Party agricultural policy."

He said it was now well over two years since the Government pledged themselves to formulate an agreed All-Party policy for agriculture. The time had come now when they had a right to ask the Government whether they intended to honour that pledge. Almost every agricultural body in the kingdom had prepared, and he thought presented to the Government, its ideas on policy, so that the Government would not find themselves short of advice when they came to consider the problem.

The Government should proceed along three main lines. First, there must be stable markets and stable prices for the basic products of agriculture. Secondly, we should see to it that we expanded our markets by ensuring that everyone had enough to eat. Thirdly, we should ensure that cheap food got to the people of the country, not through the chaotic and disorganised state of markets which brought ruin to producers, but by organising efficient production and efficient distribution. They had failed to deal with the problem in the past because none of them recognised its size and scope. Their task was to build up in the light of the war-time experience of national purchase a constructive policy for the future.

He thought it must be agreed that national remedies of tariffs and quotas were inadequate to the situation, so they were really thrown back upon the system that they adopted during the last war and this war, of national purchase. Whether that was conducted by the Ministry of Food or through Imports Boards was a matter of detail, though personally he would prefer an Import Board appointed by and directly responsible to the Government.

The purchases would be made by such a body according to market allocations, made through international machinery. The final distribution of the product would probably be carried out through existing channels, and therefore the home producer would have to have his allocation. Fixed prices would be paid to pro-

ducers and the sale price to the consumer would be based on the average of home and import produce. Any temporary surplus would either have to be put into stock or else diverted to low consumption countries, say in the Far East.

There was a large market waiting for us for products such as milk, eggs, fruit and vegetables if we could only organise so as to expand consumption. Such a policy could only be an addition to, and not a substitute for, establishing security in the market for basic products, such as wheat, meat, sugar and dairy imports. A sound agriculture could not end by just giving greater security or wider markets to producers. The community had the right to demand efficiency on the farm, efficient landowning, efficient distribution and a fair wage to the men who did the hard and skilled daily work on the farm.

Lord Addison said what he was hoping for was a policy; not a hotch-potch of derating, doles and subsidies and odds and ends such as they had been accustomed to in the past. These things were apologetic, brainless substitutes for a policy.*

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Questions

Cattle Diseases

Sir R. Clarry asked the Minister of Agriculture whether he is aware that the lack of pure drinking water for cattle is one cause of the spread of diseases in herds and the increased consumption of infected milk; and what steps he proposes to take to ensure that a supply of clean uninfected water is made available to cattle?

Mr. Hudson: I am aware that impure water supplies are one cause of the spread of disease among cattle. At the same time they play only a very minor part in the spread among dairy cattle of diseases that may infect the milk supply. My Department already assists farmers under a grant-aid scheme to carry out works of water supply in approved cases.

Sir R. Clarry asked the Minister of Agriculture when, in order to limit the spread of bovine tuberculosis in cattle, he contemplates introducing measures to prevent the sale of disease-laden cattle in the open market; and whether he will enable the appropriate tests to be made on the animals concerned before they are offered for sale?

Mr. Hudson: The removal from farm premises to a market of cattle affected with tuberculosis in a clinical form is prohibited by the Tuberculosis Order. As regards other cattle, it would be impracticable to require the passing of a tuberculin test as a general condition of entry to markets.

Sir R. Clarry: Why would it be impracticable, may I ask?

Mr. Hudson: The reasons are too long to be given in answer to a question.

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Medical Research Bodies (Representation)

Sir E. Graham-Little asked the Lord President of the Council whether he is aware that the recently appointed Director of the National Institute for Medical Research, who succeeds in that office a Nobel Prize winner in medicine, possesses no medical qualification and has had no medical training; what is the present composition of the Medical Research Council and whether he is satisfied that there is adequate representation of clinical medicine on that body?

Sir J. Anderson: The new Director of the National Institute for Medical Research is a distinguished investigator in an important branch of medical science, who has already been head of a department in a medical school of the University of London. I am aware that he is not medically qualified, but I may point out that the clinical departments of the Medical Research Council are not comprised in the National Institute. The present members of the Medical Research Council are as follow:

The Rt. Hon. Lord Balfour of Burleigh (Chairman).
Sir William M. Goodenough, Bart., D.L., J.P. (Treasurer).
Sir Charles MacAndrew, T.D., M.P.
Professor T. R. Elliott, C.B.E., D.S.O., M.D., F.R.C.P., F.R.S
Sir William Jameson, K.C.B., M.D., F.R.C.P.
Professor S. P. Bedson, M.D., F.R.S.
Mr. E. Rock Carling, F.R.C.S.
Professor F. C. Bartlett, C.B.E., F.R.S.
Professor E. D. Adrian, O.M., M.D., F.R.C.P., F.R.S.
Sir Henry H. Dale, G.B.E., M.D., F.R.C.P., F.R.S.
Professor D. Keilin, Sc.D, F.R.S.

The principal subjects represented by the eight members appointed in respect of their scientific qualifications are clinical medicine, surgery, preventive medicine, pathology and bacteriology, pharmacology, physiology and neurology, biochemistry, and psychology. I am satisfied that this provides a well balanced representation of the different branches of medical science.

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Beveridge Report (Medical Services)

Dr. Peters asked the Lord President of the Council whether, having regard to paragraph 427 of the Beveridge Report, medical herbalists, osteopaths, naturopaths, homoeopaths and others, engaged in healing the sick, will be officially recognised and their patients permitted to receive treatment from them under the future medical service scheme?

Mr. E. Brown: I have been asked to reply. The arrangements necessary for ensuring a comprehensive health service in the sense envisaged by Assumption B of Sir William Beveridge's Report are at present under consideration, and I am not yet in a position to make any further statement on the matter.

. . . . .

Colonial Research Committee

Captain Peter Macdonald asked the Secretary of State for the Colonies whether any representatives of social studies have been appointed to the Colonial Research Committee?

The Secretary of State for the Colonies (Colonel Oliver Stanley): Yes, Sir. The development of the work of the Committee made it clear that it would be of value to have among them persons with knowledge of social and economic studies and of business affairs. I am glad to announce that Professor Carr-Saunders, Sir Hubert Henderson and Sir John Caulcutt have now joined the Committee to represent these aspects.

Mr. Sorensen: Have any natives been appointed to this Committee?

Colonel Stanley: I am as anxious as anyone else to associate natives of the Colonies with various kinds of work, but this is a committee of research experts sitting in London the whole time, and my sole consideration must be to get the best experts for the particular job.

. . . . .

Food Supplies: Tuberculin-Tested Milk

Mr. Douglas asked the Parliamentary Secretary to the Ministry of Food whether arrangements can be made for a greater supply of fresh tuberculin-tested milk for infants and young children, in view of the fact that pasteurised milk is often three days old before it is consumed?

The Parliamentary Secretary to the Ministry of Food (Mr. Mabane): As indicated in my reply on February 17th to the hon. and gallant Member for Ripon (Major York), my Noble Friend is at present considering whether means can be devised to encourage the future production and consumption of tuberculin-tested milk.

Mr. Purbrick: Is it not a fact that already about three-quarters of the tuberculin-tested milk is not sold as such, but is lumped together with ordinary milk?

Mr. Mabane: Yes, Sir.

. . . . .

Dog-Race Meetings (Totalisator Receipts)

Mr. Rhys Davies asked the Home Secretary the totalisator receipts on greyhound racing tracks for each year from 1938 onwards; and whether the reduction in the number of days on which racing is allowed has had the effect of decreasing receipts proportionately?

Mr. H. Morrison: I regret that I have no official information which would enable me to answer the first part of the Question. The object of reducing the number of dog-race meetings was not to reduce the volume of betting, but to secure economies in manpower and fuel, and it may well be that the total volume of betting has not been reduced.

Mr. Davies: Is the right hon. Gentleman looking into this problem of keeping greyhound tracks open during the war?

Mr. Morrison: We have looked into it and taken the action I have indicated. It has resulted in a material reduction, and as at present advised I do not propose to go further.

The estimated decline of livestock in enemy-occupied Allied countries as a consequence of lack of feeding-stuffs, requisitioning and slaughter, is 11,000,000 cattle, 3,000,000 horses, 12,000,000 pigs and 11,000,000 sheep.

* Since the debate, a private group of members of the House of Lords (including Earl De La Warr, Lord Balfour of Burleigh, Lord Addison, Lord Bledisloe and Lord Cranworth) have produced a useful addition to the number of recently issued reports on post-war farming policy. Agricultural economics figure largely in the report, but one of the "fundamental assumptions for a successful future policy for agriculture" deserves quotation here, *viz.*, "That while a balanced agriculture is essential, a greater production and consumption of protective foods must form the basis of any sound agricultural and health policy."

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Mar. 10th.—Meeting of the West of Scotland Division, N.V.M.A., at Glasgow, 3 p.m.

Mar. 11th.—N.V.M.A. Committee Meetings at 36, Gordon Square: Drafting Committee on Artificial Insemination, 11 a.m.; Survey, 12 noon; Sub-committee on Panuel Work, 3 p.m.

Mar. 12th.—N.V.M.A. Sub-committee on Collaboration with Animal Welfare Societies, 11 a.m.; Finance and General Purposes, 1.30 p.m. (Gordon Square).

Mar. 19th.—Meeting of Council, N.V.M.A. (Adjourned Special Meeting on Veterinary Education), Connaught Rooms, Great Queen Street, Kingsway, W.C.2, 1.30 p.m.

Mar. 27th.—Meeting of the Society of Women Veterinary Surgeons, Friends' House, Euston Road, N.W., 2.30 p.m.

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Veterinary Surgeons and Military Service

In order to place the veterinary profession on the same footing as the medical and dental professions, as regards both the qualified man and the students, the Ministry of Labour has decided to dereserve veterinary surgeons. Veterinary surgeons, other than volunteers, will, however, be called up for service *in their professional capacity only*.

The number of officers required for the R.A.V.C. is at the moment not large. It is not anticipated, therefore, that any difficulty will be experienced in filling the limited number of vacancies by selection from those who volunteer their services for the Corps.

Veterinary surgeons may volunteer for general service subject to the recommendation of the Royal College of Veterinary Surgeons and the Ministry of Agriculture and Fisheries.

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Reservation of Veterinary Students

The conditions governing the reservation of veterinary students are now as follows:—

1. Students must before attaining the age of 18 have been admitted or duly accepted for admission by a recognised veterinary college.

This means that students must

(*a*) present a certificate of matriculation standard to the Secretary of the Royal College of Veterinary Surgeons (18, Victoria Avenue, Harrogate), and receive from him a certificate of registration as a veterinary student.

(*b*) obtain from the Principal of the College at which they propose to attend a certificate stating that they have been admitted, or accepted for admission to the College. This certificate is required for presentation to the local office of the Ministry of Labour at the time of registration under the National Service Acts.

2. Reservation is subject to periodical certification by the Principals that the students are making satisfactory progress in their studies; and, except in cases where exemption is granted, is also subject to their being engaged upon approved part-time national service.

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PERSONAL

Mr. Cabot Sustains a Femoral Fracture

Our readers will learn with much regret that Mr. D. A. E. Cabot, Chief Veterinary Officer, Diseases of Animals Division, Ministry of Agriculture, met with a serious accident at Waterloo Station on Tuesday, February 23rd. Mr. Cabot slipped and fell heavily when alighting from a train after a visit to Weybridge and it was at once evident that he was badly injured. He was, therefore, removed to St. Thomas's Hospital, where in due course it was found that fracture of the neck of the femur had taken place. Much sympathy will be extended to Mr. Cabot in his painful injury and in the prolonged period of his withdrawal from active duties at the Ministry both at St. Anne's and in London, at a particularly busy time. We are glad to be able to say that latest reports from the hospital show Mr. Cabot to be progressing very satisfactorily.

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Marriages.—Forbes—Frayer.—At St. Stephen's Church, Dublin, on November 17th, 1942, by the Rev. W. T. Grey, Frederick W. N. Forbes, M.R.C.V.S., Magherafelt, Co. Londonderry, to Elizabeth Rosa Frayer, Kilmanagh, Co. Kilkenny. Mr. S. R. Bolton, M.R.C.V.S., was best man.

Harbinson—McKnight.—On Tuesday, February 16th, at the King's Chapel of the Savoy, London, by the Rev. C. L. Cresswell, Captain Michael Harbinson, R.A., youngest son of the late Mr. W. J. R. Harbinson, of Larne, Co. Antrim, and Mrs. Harbinson, of 18, Fitz George Avenue, Kensington, to Mary McKnight, M.R.C.V.S., of Redgates, Tuddenham, Ipswich, widow of Wing Commander C. T. McKnight, R.A.F., and eldest daughter of Mr. and Mrs. George Jaques, of Red House Park, Ipswich.

Meiklem—Evans.—On February 23rd, 1943, at Tabernacle, Cardigan, Ralph Kerr Meiklem, M.R.C.V.S., eldest son of Mr. and Mrs. J. Meiklam, Birkhill, Nemphlar, Lanark, Scotland, to Miss Mary Margaret (Molly), only daughter of Mrs. Evans and the late Mr. Sim Evans, Auctioneer, Delfryn, Cardigan, Wales.

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Presentation to Mr. David Brown.—The esteem in which he is held by the farming community whom he has served for some forty years as a practitioner was demonstrated on the night of February 1st, when a deputation visited Mr. David Brown, M.R.C.V.S., at his residence, "The Neuk," Kilwinning, and presented him with a very handsome bureau, together with a wallet of notes, on the occasion of his retirement from practice. Mr. J. W. Young, of the West Doura, made the presentation.

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R.C.V.S. OBITUARY

Campbell, William Archibald, "Aberure," Boroughbridge, Yorks. Graduated Glasgow, May 22nd, 1898. Died February 22nd, 1943; aged 65 years.

Elliott, Harold Beaty, Deputy Territorial Veterinarian, Keeaukaha, Hilo, Island of Hawaii. Graduated Edinburgh, May 22nd, 1894. Died February 25th, 1943.

Mr. William A. Campbell, M.R.C.V.S.

It is with deep regret that we record above the death of Mr. W. A. Campbell, of Boroughbridge, a practitioner held in high esteem, and one who, more particularly in our correspondence columns, contributed to this journal, from his wide experience, valued comments from the fields of bovine and equine practice, his last letter appearing as recently as our issue of February 13th.

An Appreciation

Mr. A. G. Rae, M.R.C.V.S., of Riverhulme, Boroughbridge, sends the following tribute:—

"The passing of Mr. William A. Campbell, of Boroughbridge, has come as a severe shock to the veterinary profession, the farming community and a wide circle of friends. A native of Ayrshire, in all his 40 years' practice in Yorkshire, he never lost that Scottish brogue which along with his genial, unassuming manner, outstanding capability and profound knowledge, gained for him the esteem and respect of a large agricultural community. He was a man with a sound knowledge of horses and his death will be a great loss to the racing and hunting fraternity. He took a keen interest in the future of the profession and, though a great believer in the old remedies, nevertheless kept abreast of all the latest methods.

I have been privileged to practise with Mr. Campbell for the past four years and coming to him as I did straight from College, I count myself fortunate to have been the recipient of the valuable advice he so gladly gave.

Deepest sympathy goes out to Mrs. Campbell and family in their grievous loss."

The funeral at Boroughbridge was the largest and most representative ever seen in the district.

The Yorkshire Veterinary Medical Association was represented by Mr. John McKellar and other members of the profession present were Messrs. Powley, sen., Powley, jun., Lieut.-Col. Dixon, Messrs. W. Crawford, T. C. Hall, J. W. Procter, R. I. Wood, D. V. Sinclair, R. J. Smith, A. G. Rae (partner), H. Lloyd (assistant).

The Late Mr. Daniel Hamilton, F.R.C.V.S.

An Appreciation

Mr. James Robertson, M.R.C.V.S., of Wolverhampton, writes: "It was with great sorrow that I read in your issue of February 20th of the death of Daniel Hamilton, F.R.C.V.S., of Harrogate, one of my oldest friends in the veterinary profession, and the last of the

three veterinary surgeons of that family. Some 40 years ago, when the Glasgow Corporation took over the old private tramway system, Mr. J. B. Hamilton, of Buntree Hill, Hamilton, was appointed veterinary surgeon to the Corporation Tramways, and his brother Daniel (who was then in England) came home and took over his practice. The Corporation was then buying in large numbers of horses, and many were dying of "pink eye"; Mr. John Hamilton had a very busy time, and his brother, Mr. Tom Hamilton (then in England), came up to help him. Eventually Mr. J. B. Hamilton was appointed Traffic Manager and Mr. Tom took over the veterinary department, where I was pupil with him for 12 months. The Corporation then owned some 3,500 horses and it was a picture and the talk of the country to see such beautifully matched pairs of stepping horses drawing tramcars: often, when we passed one we fancied, we would take the number, and the next week it would be in the vet.'s trap.

I well remember just then there was a new traffic tunnel opened under the Clyde. You drove into a large circular cage, the wheels were blocked before and behind, the doors shut, and down you went to the bottom, through the left-hand tube into another cage and up on the other side. The first day many horses took fright, as ours did, when the cage began to descend, but this was soon remedied by an awning fixed so that the horses could not see the machinery working. I was with Mr. Daniel Hamilton, at Hamilton, as a pupil in his large general and colliery practice (I went down as many as 12 pits in a day seeing to cases) and took sole charge of his practice for eight weeks when he went up to London to take his post-graduate course and at the same time took his Fellowship examination.

To these three gentlemen I owe a debt of gratitude for all they did for me, so willingly and ungrudgingly, in the way of imparting practical education which has stood me well in busy practices ever since."

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GENERAL OBITUARY

Mr. Hal Williams

Many of our readers, knowing Mr. Hal Williams personally, will regret to hear of his death at the age of 69. *The Meat Trades Journal* records that in 1929 Mr. Williams designed and supervised the construction of the Sheffield Corporation abattoir and wholesale meat market. He was consulting engineer to the New Zealand Government in London, and to various large British municipal and commercial corporations. He planned the refrigeration section of that Dominion's exhibit at the Wembley Exhibition, and later the New Zealand Pavilion at the Glasgow Exhibition. At the time of his death he was constructing 24 reserve cold stores in various parts of Britain for the Ministry of Food as consultant to the Ministry of Works. Mr. Williams was a founder of the New Zealand Masonic Lodge in London, and held London rank. With Mrs. Williams he was also prominent in the formation of the New Zealand War Services Association at the outbreak of the present war.

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AGRICULTURAL IMPROVEMENT COUNCIL

Chief Technical Officer

Announcement is made by the Ministry of Agriculture that the Dartington Hall Trustees have generously agreed to a request from the Agricultural Improvement Council of England and Wales that Dr. W. K. Slater, Director of the Agricultural and Industrial Departments of Dartington Hall, should be seconded for service as chief technical officer to the Council.

Dr. Slater graduated with first-class honours in chemistry at Manchester University; subsequently he carried out biochemical research at Manchester and University College, London, and was Senior Beit Memorial Research Fellow. For the past twelve years, as Director of the Agricultural and Industrial Departments at Dartington, he has had wide experience in agriculture and the industries connected with it, both from the research and practical aspects.

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ROYAL ARMY VETERINARY CORPS

The issue of *The London Gazette* of February 19th, 1943, contains the following announcement:—

The undermentioned to be Lts.:—

John Ritchie (254719), December 8th, 1942; Derek Hugh Greeves (257210), December 21st, 1942; Walter Brian Bamber (257509), January 3rd, 1943; Reginald Bark Griffiths (260090), January 22nd, 1943; George Eric Greenwell (260464), January 29th, 1943.

CONTROL OF DISEASES OF DAIRY CATTLE

Statement showing the Number of Undertakings notified to the Ministry of Agriculture during the month of February, 1943

Country	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
England and Wales					
Bedford	1	31	32	712	480
Berks	4	66	70	2,529	1,692
Bucks	3	50	53	1,378	956
Cambridge	1	14	15	258	118
Chester	14	330	344	11,408	3,921
Cornwall	2	4	6	106	86
Cumberland	5	34	39	1,031	884
Derby	21	209	230	6,911	3,939
Devon	15	115	130	2,210	1,305
Dorset	5	48	53	1,714	942
Durham	18	197	215	5,121	1,705
Essex	13	178	191	7,278	4,131
Gloucester	5	69	74	2,379	1,235
Hampshire	21	265	286	8,736	5,518
Hereford	4	20	24	420	247
Hertford	2	57	59	1,976	1,208
Hunts	2	8	10	334	221
Isle of Ely	—	1	1	1	8
Isle of Wight	4	11	15	292	137
Kent	13	96	109	2,408	1,286
Lancs	23	148	171	4,907	1,461
Leics	9	64	73	1,933	1,286
Lincs (Holland)	—	4	4	45	11
Lincs (Kesteven)	—	19	19	233	120
Lincs (Lindsey)	8	59	67	1,309	654
Middlesex	1	10	11	507	224
Norfolk	4	151	155	4,651	2,964
Northants	2	61	63	1,744	1,205
Northumberland	1	47	48	1,566	761
Notts	5	99	104	2,418	1,348
Oxford	2	29	31	939	863
Rutland	—	8	8	145	102
Salop	5	202	207	6,573	3,152
Soke of Peterborough	—	1	1	37	31
Somerset	17	114	131	3,679	1,508
Staffs	14	147	161	4,709	2,398
Suffolk, E.	2	72	74	1,844	1,301
Suffolk, W.	1	39	40	891	556
Surrey	4	99	103	2,906	1,311
Sussex, E.	8	146	154	4,140	2,339
Sussex, W.	3	93	96	2,569	1,553
Warwick	8	96	104	2,704	1,674
Westmorland	—	17	17	467	537
Wilts	7	58	65	2,933	1,372
Worcester	6	118	124	2,733	1,347
Yorks, E.R.	2	66	68	1,118	583
Yorks, N.R.	10	80	90	1,869	1,088
Yorks, W.R.	14	205	219	5,523	1,990
Anglesey	1	32	33	589	368
Brecon	—	3	3	50	22
Caernarvon	1	101	102	1,716	861
Cardigan	2	14	16	202	153
Carmarthen	10	168	178	3,315	1,652
Denbigh	3	48	51	1,037	533
Flint	4	88	92	2,042	913
Glamorgan	3	68	71	1,172	420
Merioneth	—	10	10	123	82
Monmouth	3	33	36	823	505
Montgomery	2	11	13	239	169
Pembroke	6	74	80	1,522	946
Radnor	—	—	—	—	—
Totals	344	4,705	5,049	135,124	70,382
Scotland					
Aberdeen	5	18	23	1,054	327
Angus	—	17	17	659	232
Argyll	1	3	4	73	78
Ayr	5	37	42	1,499	1,218
Banff	—	2	2	103	20
Berwick	—	1	1	33	22
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan	—	4	4	123	98
Dumfries	3	13	16	879	715
Dumbarton	—	3	3	105	86
East Lothian	1	6	7	191	100
Fife	5	17	22	848	524
Inverness	—	7	7	165	111
Kincardine	3	—	3	147	68
Kinross	—	3	3	68	29
Kirkcudbright	2	12	14	888	708
Lanark	3	14	17	595	470
Midlothian	—	1	1	44	69
Moray	—	—	—	—	—
Nairn	—	1	1	14	—
Orkney	—	—	—	—	—
Peebles	2	2	4	67	39
Perth	5	16	21	544	302
Renfrew	1	8	9	384	297
Ross-shire	—	4	4	128	72
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	1	25	26	786	591
Sutherland	1	2	3	77	61
West Lothian	1	1	2	99	70
Wigtown	3	26	29	2,056	1,141
Zetland	—	—	—	—	—
Totals	42	243	285	11,629	7,448

Note.—Of the total 5,049 undertakings notified to date, 1,340 are for 1 year, 324 are for 2 years and 3,385 are for 3 years.

Duration of Undertakings: 1 year, 75; 2 years, 25; 3 years, 185.

SCIENCE AND GOVERNMENT

Many Members of both Houses of Parliament, including three Cabinet Ministers, and representatives of the scientific bodies associated with the Parliamentary and Scientific Committee, attended the second annual luncheon of the Committee held on February 11th, 1943.

Viscount Samuel outlined the constitution and purposes of the Committee, which, he said, fulfilled a need in facilitating liaison between public opinion and the Government of the day in respect of the utilisation of the scientific resources of the country. The Committee had in membership 58 Members of the House of Commons and 16 Peers, while 33 institutional authorities were officially represented. Debates in both Houses had been instituted; deputations and conferences were organised and specific points, presented mostly by these organisations, were considered by the Committee, and if the case required it, representations were made to the Government either directly or through Parliamentary action. Furthermore, they had the useful and salutary function of occasional criticism: a Government team, however well intentioned, was rather like slow-going oxen and sometimes needed the goad. They had to consider the interests of scientific workers and later on they would be turning their attention to the scientific aspects of post-war construction.

Sir John Anderson, Lord President of the Council, who has now become responsible for the Government's scientific services, recalled that Sir Stafford Cripps had already outlined the existing arrangements for scientific research and development in his address on January 30th before the conference on "Planning of Science: in War and in Peace." He would devote himself, therefore, to the general principles which he believed should govern such arrangements. Before doing so, however, Sir John had a word to say on the "fashionable" assertion that of course before the war statesmen and administrators took no account of the part which science would obviously have to take in a future conflict and failed disgracefully to make anything like adequate preparation. That, as his hearers were well aware, was very far from the truth. In fact, as a result of the experiences of the last war, the departments concerned started right away to organise things. When he became Minister of Home Security in November, 1938, one of his first steps was to establish a suitable scientific organisation within his Ministry. Nevertheless, he was, and had been for a long time, fully conscious of the feeling which existed that there was something not quite right in the higher organisation of our scientific effort in relation to the functions of Government, and it had been his business as Minister specially concerned within a limited field with scientific matters, to study this particular problem and see whether means could not be found of improving the organisation. This was an organisational problem; it was not an easy one: the problem was not confined to the field of science in the ordinary acceptance of that term.

For the solution of the problem there were, in his view, four main conditions which must be satisfied: the organisation must be an integral part of the Government machine; it should maintain contact with outside scientific bodies; it must not cut across normal ministerial responsibilities; and it must be linked up with a Minister who is in a position to see that extra-departmental considerations are not neglected. The present organisation of scientific effort, with the scientific advisers to the Ministry of Supply, the Scientific and Engineering Advisory Committees and so on, was, in his opinion, on the right lines. Those three Scientific Advisers had a definite departmental function: they were responsible unquestionably to a single Minister, the Minister of Production. But they had been linked up with another Minister. At first it was Sir Stafford Cripps who offered to act as a sort of ministerial sponsor in scientific matters. Now that function had been assigned to him (Sir John) and the arrangement was this: that while these three Scientific Advisers report directly to the Minister of Production on matters arising directly within the production field, they were free at all times to come to him with problems of a more general character, and he was in a position to ensure that their representations received due attention. Not only that, they were also entitled to have direct access to the body known as the Scientific Advisory Committee, of which the Chairman is Sir Henry Dale and of which he was the titular President. In that way they had created an organisation of a character which promised well and which was capable of considerable development. He believed that working upon those lines they would, with practical experience be able to establish on a firm basis a sound organisation for the post-war period.

Sir Robert Robinson spoke on the importance of the international control of explosives. As all the explosives in use by armed forces depend on the supply of nitrates, he urged the control of synthetic nitrate and similar plants as a measure for ensuring that aggressor nations shall not resort to war.

THE B.M.A. AND THE BEVERIDGE REPORT

The Council of the British Medical Association has considered the Beveridge Report and approved a resolution in the following terms:—

"That if Parliament, after consideration of the Beveridge Report, decides to accept the assumptions of the Report, and to put into operation the proposals of the Report, taken as a whole, including a scheme for comprehensive health and rehabilitation services for prevention and cure of disease and restoration of capacity for work, available to all members of the community, the Association would be willing to co-operate in the preparation of such a scheme provided (*a*) that the character, terms, and conditions of the medical service are determined by negotiation and agreement with the medical profession, and (*b*) that those members of the community who decide not to avail themselves in part or in whole of the benefits of the service open to them should not be precluded from obtaining the medical services they desire from doctors within the scheme paying for such services privately, with the necessary safeguards to prevent abuse."

This resolution is to be put as a recommendation to a special representative meeting to be called to consider the single issue on March 31st.

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LEGAL NOTES

Rat Extermination Contract: Cattle Deaths.—Arising from the deaths of cattle on a farm, Salop County Council Finance Committee (says *The Farmer and Stock-Breeder*) reported that judgment had been given in the action brought against the County Council by Mr. Chas. Wynn (Tetchill). He claimed £2,552 2s. 7d. for loss of animals (including loss in condition and milk of several), alleged to be due to poisoning as a result of treating Mr. Wynn's premises for the extermination of rats and mice under contract with the County Council.

The losses were alleged to have been caused as a result of the treatment by the Council of Mr. Wynn's premises by the use of a substance called "Cynogas," an American preparation, of which the sole distributors were George Munro, Ltd., who had been cited as third parties.

Mr. Justice Lawrence had found that plaintiff was entitled to recover from the County Council damages in respect of the injuries to and death of the animals complained of in the statement of claim, the amount of such damage to be ascertained by an official referee (or agreed between the parties), plaintiff to recover costs from the County Council and the County Council to recover from the third party one half of the costs paid by the Council to plaintiff; in addition, the third party to pay such of the Council's costs as were solely referable to the third party proceedings.

It was recommended that the special sub-committee which had been dealing with the case should now effect a settlement.

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Erratum.—"The Application of Sulphonamides in Veterinary Practice" (G. M. Gould, *Vet. Rec.* **55**. 107). *For* lines 45-47 in col. 1, having reference to sulphaguanidine: "It is, unfortunately, of no value in the treatment of rabbits with coccidiosis owing to its becoming acetylated and then absorbed from the bowel" *read* ". . . owing to its being absorbed from the bowel and then becoming acetylated."

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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CHRONIC CONTAGIOUS MASTITIS: RELATIONSHIP BETWEEN CLINICAL SYMPTOMS AND INFECTION WITH *STREPTOCOCCUS AGALACTIAE*

Sir,—I was interested in the article written by Mr. Kennedy, on the above subject, which was pulished in the *Record* on January 23rd.

During the past several years, I have been associated with the control of mastitis in a number of dairy herds. This control has been based on the laboratory testing of milk samples from all lactating cows; the interval between tests has generally been three to four months. (The tests consisted either of deep plating the deposit of 10 c.c. milk into Edwards' crystal violet aesculin blood agar, or else of inoculating 3 c.c. McKenzies' thallium acetate

medium with 0·1 c.c. gravity cream and plating a triple loopful of any resulting growth into plain blood agar). The same test was applied to individual cows if they entered the herd between the periodic examination. A card index system allowed us to trace the mastitis history of each cow in the herd.

In such herds the more efficient milkers have sometimes remarked that they noticed slight changes " in the feel " of the udder for some time before a previously healthy cow was reported as infected. These observations are only significant when tests have been carried out at short intervals. Similarly, when reference to the card index is made in order to study the history of a new infection, it appears that not infrequently a quarter shows a slightly abnormal centrifugal deposit for several successive tests and that the tests immediately preceding that in which the infection was discovered show the milk to contain a large number of organisms generally accepted as being non-pathogenic (*e.g.*, non-haemolytic streptococci which do not fall into a specific category). Unfortunately, too much stress cannot be laid on this matter unless a critical survey of the history of many cows both infected and non-infected is carried out. At the same time, these two " impressions " taken with the more concrete facts put forward by Mr. Kennedy do suggest that there is more in the question of the relationship between *streptococcus agalactiae* and chronic contagious mastitis " than meets the eye."

Occasionally, for instance, one encounters a case of the acute type of Group I mastitis (*i.e., Str. agalactiae*) occurring in a cow which has passed all previous mastitis tests, the last of which may only have been carried out a few days or weeks previously; such a cow may be placed in the byre in such a position that she is in the middle of the apparently non-infected beasts. When milk from such a case is examined, *streptococcus agalactiae* is usually present in large numbers. (Where the milk is grossly altered, however, the first sample may appear sterile.)

These phenomena can probably be explained in either of two ways:—

(*a*) It may be suggested that *streptococcus agalactiae*, whilst being an important factor, is not necessarily solely responsible for chronic contagious mastitis. It is becoming apparent that *streptococcus agalactiae* cannot be regarded as an entity; Stableforth (working from the serological aspect) and Brown (working with lactose and salicin) have both described various types of the organism. Whether this has any connection with virulence has yet to be decided.

(*b*) Doubt may be cast on the efficiency of present milk testing methods, as is suggested by Kennedy. In this connection it may be pointed out that in the work referred to the milk was drawn into tubes containing sodium azide and thence streaked on to media containing crystal violet. We know that both these chemicals retard the growth of *streptococcus agalactiae*, and it is possible that a technique which involves the use of two such deterrents may be unreliable. Whilst working at Leeds University we have found that sterile milk containing sodium azide was not a good culture medium for *streptococcus agalactiae*, and in fact we not infrequently obtained negative results with the medium when there was ample evidence to show that *streptococcus agalactiae* was present. It is unlikely, however, that this question of delicacy of the test employed would explain entirely the problem of udder tissue changes in the absence of pathogenic bacteria. Severe tests, such as the incubation of unadulterated milk samples for 12 hours at 37° C. and then plating on to blood agar, give widely varying indications of the value of such a technique; these tests do, however, suggest that some of the tests relied on in the past were not sufficiently delicate.

This gives rise to the question " Is mastitis control based on bacteriological testing of milk worth while, or is clinical examination more reliable?" My experience in connection with mastitis leads me to the opinion that the only reliable method of such control is that based on the periodic bacteriological testing of milk samples from all cows in the herd. Clinical examination, however, is a useful, and essential, adjunct to bacteriological testing.

I base the above opinion on two factors. Firstly, whilst it is not uncommon to find udder changes in apparently non-infected animals, it is even more common to find animals which are excreting *streptococcus agalactiae* on all occasions when tests are carried out, and yet which do not manifest any detectable changes in the udder. On several occasions we have encountered fairly definite examples of such cows infecting neighbouring animals. Secondly, we have found that where control, which is based on bacteriological testing of milk samples, has been carried out intelligently, the results have in a great majority of cases been well worth the time and attention expended. Where such control has not been effective, it has usually been found that the farmer has not been carrying out correctly the simple rules of control. In fact, the chief difficulty to be overcome in the immediate future is the disinterest that the farming community has in the whole question of mastitis.

I should like to take this opportunity of correcting an error I made in my letter published in this journal on October 31st, 1942, in connection with summer mastitis. I referred to an article as being written by Messrs. Lamont and Foggie; this work was, in point of fact, published by A. Thompson, of Belfast. I trust this error has not caused any inconvenience to the gentlemen in question.

Yours faithfully,

Agricultural Advisory Office, R. W. Roach, M.R.C.V.S.
22, Berkeley Square,
Bristol, 8.

February 23rd, 1943.

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FERTILITY AND INFERTILITY IN THE BOVINE

Sir,—I am grateful to your correspondents for their helpful criticism. I am amazed, however, that Maj. Roche-Kelly should suspect me of what one might translate, from his letter, as a " leg-pull." I will admit, however, that a few clinical sprats, tossed into the ocean, may attract some of its more colourful denizens.

I am extremely glad to welcome my friend, Mr. Gould, into the field. His discourse is always illuminating, but I wish, for the benefit of your readers, he had himself provided the answers to some of his queries. His failure to produce contraction of the uterus by stroking intrigues me. Mr. Gould has experienced the same disappointment.

Mr. Gould asks how I diagnose hyperplasia. I am in the happy position of being able to direct a suitable proportion of my cases into the public abattoir, *via* the collecting centre. My numerous examinations, carried out over a number of years, together with the reports I have received from persons best qualified to advise me, have convinced me that in Cornish Guernseys, at least, the condition is a common one. Like many other clinicians, I am depending upon my own locality to provide my material and it is equally possible that Southampton cows have their own little idiosyncrasies also.

Regarding *corpus luteums persistens*, I can only assure Mr. Gould that I have made many successive rectal examinations in the same animal, in order to settle a doubt, in the anoestrous cow, where the corpus luteum has remained as a constant feature and the normal changes in the ovary as the result of an oestrous cycle have been absent. If Mr. Gould has so far been unlucky, I strongly advise him to keep on trying and I think he will eventually be convinced. I have had the opportunity to *post-mortem* a number of these cases and I have observed the shrinkage and " embedding " of the corpus luteum, the thickening of its epithelial covering and the absence of follicle development in either ovary.

I am sorry that Mr. Gould thought it necessary, on behalf of the Survey Committee, to disclaim any advice which included indiscriminate expression of the corpus luteum. When, in my paper, I attributed this to the " best authorities," the committee in question did not enter my mind at all.

My statement that " the importance of specific infection as a primary cause of sterility may, therefore, in many cases have been unduly exaggerated " is also based on a fairly wide experience of local conditions and I am prepared to admit that in the type of commercial herd existing in some other areas, maintained by the cowkeeper as opposed to the dairyman, where there is constant chopping and changing of stock with entire disregard of infection, the picture may be entirely different. This, however, does not affect my statement that infertility is almost equally rife in other districts where there is comparative freedom from infections. I have certainly not noticed that the lesions of contagious granular vaginitis disappeared in pregnant cows about the fifth to seventh months of pregnancy and reappeared at the eighth to tenth week after parturition. In the few true outbreaks of a disease in which the clinical picture corresponded with that of the disease in question, I was unable to induce a state of pregnancy in any of the cows affected. Is Mr. Gould confusing the " granules " of contagious vaginitis with the normal mucous follicles present in the region of the clitoris and on the walls of the vagina just within the vulva?

My statement as to the latent existence of trichomoniasis in cows was based on my own experience that in infected herds it is not uncommon to find a few animals in which trichomonas can be found in the vaginal exudate, at oestrus, without visible clinical evidence of the fact. As there is no control over the distribution of affected

cattle, it follows that such animals may find their way into healthy herds and convey infection *via* the bull.

Mr. Gould's defence of *C. pyogenes* and his statement that its existence as the true causal factor when associated with trichomonas, has never been substantiated, is interesting, but the suggestion was never mine. It is certain, however, that *C. pyogenes per se* is capable of setting up grave infection and long-standing infertility.

It will certainly be dangerous if practitioners accept Mr. Gould's theory that the bull is amenable to treatment. Even if, as he says, the fertility of the bull is not impaired, he remains a potential carrier of infection, more particularly if his semen is the vehicle of transmission. I may be a pessimist, but I would hesitate to accept even the assurance of Mr. Gould himself, that any bull was free from infection on the evidence obtained from the use of Abelein's method.

I cannot see that Mr. Gould's explanation of the "cures" from uterine irrigation is any more convincing than the one I offered. In any case my suggestion was not original; it has already been propounded by at least three eminent physiologists. His objection to glycerine or sugar solution as a substitute for iodine is remarkable. Surely neither of these agents can be any the worse for an added lymphagogue action.

Mr. Gould has apparently misread my advice as to the occasional use of a cross-bred bull or one chosen for stamina, rather than for production. I was not referring to treating the cow to be served by him, but I was suggesting that the offspring from such a cross might exhibit greater fertility.

Finally, as regards the administration of stilboestrol in the treatment of "shy bullers," Mr. Gould asks how the date of expected oestrus is determined. I can only remind him that nowadays one usually forms an opinion from rectal examination. Even "shy bullers" exhibit an oestrous cycle and occasionally ovulate.

I do not agree that stilboestrol is the best contraceptive available to-day—there are others far more dependable. I do not propose to be drawn into any further discussion and apologise for the space consumed. Like some of your contributors, I admire lucidity and exactitude, but I think it should be required in critics as well as in essayists.

Yours faithfully,

Vean House, R. H. Smythe.
Camborne.
February 17th, 1943.

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BEET PULP FOR HORSES

Sir,—As one who periodically meets with choking in the horse from beet pulp I am interested in the correspondence. Mr. C. P. Hynes says: "Lang's salt solution is recommended." Does he refer to the intravenous injection of salt and sod. cit.? I presume he does, but I have not tried it, being somewhat sceptical of the results, because in those cases met with here the packing is so tight that peristalsis appears to be out of the question. One of my clients found one bucketful of pulp to absorb six times its own volume of water.

Some years ago two of your correspondents described their method of removing the pulp by means of the stomach tube and pump—I regret I cannot recall their names—and to them I am indebted for the technique now employed.

The tube is pushed into the mass and a little water pumped in to stir it up; the pump is then removed as quickly as possible and the tube withdrawn a few inches to allow syphonage to take place. Repeat until the pulp is completely removed, a process which usually takes an hour where the oesophagus is blocked throughout its entire length as is usually the case. The head is kept as low as possible—this is not always easy—and the patient very often becomes restive, objecting strongly to the treatment, especially as the coughing is often very distressing. Whether any pulp then gains entrance to the trachea I do not know, but it appears to be quite probable. So to obviate septic pneumonia, if possible, common salt lb. i, formalin oz. i, aqua C. iii-iv is administered by the tube and pump as soon as the beet pulp has been removed.

For 23 years this after-treatment has been proved to be 100 per cent. efficient in cases where medicinal agents have gained entrance to the trachea and lungs during drenching, provided treatment has been adopted within an hour or two of the accident: and there is reason to believe that after the operation for the removal of the beet pulp the same treatment is of great value.

Yours faithfully,

Brigg, W. W. Lang.
Lincs.
February 14th, 1943.

WARBLES

Sir,—In view of the scarcity of derris it may be of interest to practitioners to know of the following.

A few years ago I suggested to an owner that a saturated solution of common salt might be efficacious. This was liberally applied to the back by means of a soft cloth. The owner reported that a few days after treatment shrivelled up and dead warbles slipped out easily, followed by rapid healing of the skin wounds.

He observed also that certain types of flies were repelled by the dried salt on the coats and so he sprayed his cows night and morning with the solution. The result was that he had more milk than ever before, his cows never looked better, and only once did he see them gadding.

Yours faithfully,

Brigg. W. W. Lang.
February 17th, 1943.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Jan. 16th to 31st, 1943 ...	14	1	—	19	28
Corresponding period in—					
1942 ...	18	—	1	16	28
1941 ...	27	29	2	23	110
1940 ...	34	1	1	13	152
Total Jan. 1st to 31st, 1943	28	8	—	28	41
Corresponding period in—					
1942 ...	30	—	3	47	42
1941 ...	52	51	2	45	250
1940 ...	55	5	5	36	342

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at January 31st, 1943, was as follows:—

England	Wales	Scotland	Total (Great Britain)
3,892	8,816	3,393	16,101

Department of Agriculture (Veterinary Section) Irish Free State

RETURN OF TOTAL NUMBERS OF OUTBREAKS OF DISEASES REPORTED

Period	Anthrax	Foot-and-mouth	Parasitic Mange	Sheep Scab	Swine Fever
Oct. 1st to Dec. 31st, 1942 ...	—	—	—	73	—
Total Jan. 1st to Dec. 31st, 1942 ...	—	—	—	114	—
Corresponding period in—					
1941 ...	1	556	1	157	—
1940 ...	2	—	1	177	—
1939 ...	—	—	—	214	1

BOVINE TUBERCULOSIS

For the twelve months ended December 31st, 1942, there were 964 outbreaks and 964 animals declared affected. (In this Return the term Outbreak signifies each separate place where animals were found suffering from Tuberculosis of the Udder, Tuberculous Emaciation, or giving Tuberculous Milk, or affected with Chronic Cough and showing definite clinical signs of Tuberculosis.)